

**\* Talented Program in Physics** (*Dated September 30<sup>th</sup>, 2015*)

<b>Total credits of the curriculum:</b>	<b>170 credits</b>
<b>- General education knowledge</b> <i>(not including physical education, military defense education, and soft skills):</i>	<b>33 credits</b>
<b>- Basic courses:</b>	<b>2 credits</b>
<b>- Fundamental courses:</b>	<b>21 credits</b>
<b>- Core courses:</b>	<b>34 credits</b>
<b>- Advanced courses:</b>	<b>80 credits</b>
+ <i>Required:</i>	<i>52 credits</i>
+ <i>Elective:</i>	<i>18/173 credits</i>
+ <i>Undergraduate thesis:</i>	<i>10 credits</i>

## Available curriculum

No.	Code	Subject	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
<b>I</b>		<b>General education knowledge</b> <i>(Not including subjects 11-13)</i>	<b>33</b>				
1	PHI1004	<i>Fundamental Principles of Marxism - Leninism 1</i>	2	24	6		
2	PHI1005	<i>Fundamental Principles of Marxism - Leninism 2</i>	3	36	9		PHI1004
3	POL1001	<i>Ho Chi Minh Ideology</i>	2	20	10		PHI1005
4	HIS1002	<i>The Revolutionary Line of the Communist Party of Vietnam</i>	3	42	3		POL1001
5	INT1003	<i>Introduction to Informatics 1</i>	2	10	20	2	
6	INT1005	<i>Introduction to Informatics 3</i>	2	12	18		INT1003
7	FLF2101	<i>General English 1</i>	4	16	40	4	
8	FLF2102	<i>General English 2</i>	5	20	50	5	FLF2101
9	FLF2103	<i>General English 3</i>	5	20	50	5	FLF2102
10	FLF2104	<i>General English 4</i>	5	20	50	5	FLF2103
11		<i>Physical Education</i>	4				
12		<i>National Defence Education</i>	8				
13		<i>Soft Skills</i>	3				
<b>II</b>		<b>Basic courses</b>	<b>2</b>				
14	PHI1051	<i>Introduction to Logic</i>	2	20	6	4	
<b>III</b>		<b>Fundamental courses</b>	<b>21</b>				
15	PHY1010	<i>Linear Algebra</i>	5	45	30		
16	PHY1011	<i>Calculus 1</i>	5	45	30		
17	PHY1012	<i>Calculus 2</i>	5	45	30		PHY1011
18	PHY1109	<i>Probability and Statistics</i>	3	30	15		PHY1011
19	CHE1080	<i>General Chemistry</i>	3	42		3	

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				Lecture	Practice	Self-study	
<b>IV</b>		<b>Core courses</b>	<b>34</b>				
20	PHY1013	<i>Complex Function</i>	3	30	15		PHY1012
21	PHY3604	<i>Differential Equation</i>	3	30	15		PHY1010 PHY1012
22	PHY2301	<i>Mechanics</i>	4	45	15		
23	PHY2302	<i>Thermodynamics and Molecular Physics</i>	3	30	15		PHY1011 PHY2301
24	PHY2303	<i>Electricity and Magnetism</i>	4	45	15		PHY1012
25	PHY2304	<i>Optics</i>	3	32	12	1	PHY2303
26	PHY2404	<i>Quantum Mechanics I</i>	4	45	15		PHY2304
27	PHY2004	<i>Nuclear Physics</i>	2	30			PHY2301
28	PHY2064	<i>Atomic Physics</i>	2	22	8		PHY2304
29	PHY2307	<i>General Physics Practice 1</i>	2		30		PHY2302
30	PHY2308	<i>General Physics Practice 2</i>	2		30		PHY2303 PHY2307
31	PHY2309	<i>General Physics Practice 3</i>	2		30		PHY2304 PHY2308
<b>V</b>		<b>Advanced courses</b>	<b>80</b>				
V.1		<i>Required</i>	52				
32	PHY3609	<i>Analog Electronics</i>	3	30	15		PHY2303
33	PHY3610	<i>Digital Electronics</i>	3	30	15		PHY3609
34	PHY3601	<i>Mathematics in Physics</i>	2	20	10		PHY1010 PHY1012
35	PHY3502	<i>Computational Physics 1</i>	3	30	15		INT1005 PHY1010 PHY1012
36	PHY3605	<i>Theoretical Mechanics</i>	4	45	15		PHY1012 PHY2301
37	PHY3606	<i>Electrodynamics</i>	4	45	15		PHY1010 PHY2304
38	PHY2174	<i>Quantum Mechanics 2</i>	3	45			PHY2404

No.	Code	Subject	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
39	PHY3608	<i>Statistical Mechanics</i>	4	45	15		PHY3605 PHY3606
40	PHY3506	<i>Experimental Methods in Modern Physics</i>	2	25	5		PHY2308
41	PHY2166	<i>Modern Physics Laboratory</i>	3	15	30		PHY3506
42	PHY3508	<i>Computational Physics 2</i>	3	30	15		PHY3502
43	PHY3509	<i>Physics of Matter</i>	3	30	15		PHY2404
44	PHY3510	<i>Introduction to Astronomy</i>	3	30	15		PHY2304
45	PHY3346	<i>Solid State Physics</i>	3	33	12		PHY2404
46	PHY3603	<i>Introduction to Quantum Field Theory for many-body system</i>	3	35	10		PHY2404 PHY3608
47	PHY3419	<i>Physics of the Earth</i>	3	30	10	5	PHY2304
48	PHY4076	<i>Seminar in Research Topics</i>	3	5	40		
V.2		<i>Elective</i>	<i>18/173</i>				
49	PHY3347	<i>Semiconductor Physics</i>	3	35	6	4	PHY2404 PHY3608
50	PHY3462	<i>Introduction to Nanotechnology</i>	3	30	15		CHE1080 PHY3346
51	PHY3461	<i>Introduction to Materials Science</i>	3	40	5		PHY2404
52	PHY3527	<i>Introduction to Quantum Theory of Magnetism</i>	3	35	10		PHY2404
53	PHY3351	<i>Physics of Semiconductor Devices</i>	3	35	5	5	PHY3347
54	PHY3422	<i>Magnetism</i>	3	40		5	PHY2303 PHY2404
55	PHY3420	<i>Superconductivity</i>	3	40		5	PHY3346
56	PHY3446	<i>Cryogenic Physics and Technology</i>	3	30	15		PHY3422 PHY3420 PHY3608
57	PHY3355	<i>Laboratory in Solid State Physics</i>	3		45		PHY3346 PHY3461
58	PHY3358	<i>Laboratory in Cryogenic Physics</i>	3	15	30		PHY3446

No.	Code	Subject	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
59	PHY3377	<i>Laboratory in Computational Materials Science</i>	3	10	30	5	PHY3346
60	PHY3401	<i>Optical Communication</i>	3	35	10		PHY2304
61	PHY3329	<i>Laser Physics and Applications</i>	3	42	0	3	PHY2304
62	PHY3388	<i>Atomic Spectroscopy</i>	3	42	0	3	PHY2404 PHY3606
63	PHY3390	<i>Molecular Spectroscopy</i>	3	45			PHY2404
64	PHY3391	<i>Experimental Spectroscopy</i>	3	40	3	2	PHY2404
65	PHY3356	<i>Laboratory in Quantum Optics</i>	3	10	30	5	PHY2304
66	PHY3513	<i>Group Theory</i>	3	30	10	5	PHY1010 PHY1012
67	PHY3505	<i>Methods of Mathematical Physics</i>	3	30	15		PHY1010 PHY1012
68	PHY3514	<i>Introduction to Quantum Field Theory</i>	3	35	10		PHY2404
69	PHY3126	<i>Solid State Theory</i>	3	35	10		PHY2404 PHY3608
70	PHY3500	<i>Introduction to Relativity Theory and Quantum Physics</i>	2	28	0	2	PHY3605
71	PHY3337	<i>Low dimensional physics</i>	3	35	10		PHY2404 PHY3608
72	PHY3524	<i>Introduction to General Relativity</i>	3	35	10		PHY2404
73	PHY3600	<i>Introduction to Physics of Soft Matter and Biophysics</i>	3	36	9		PHY2303
74	PHY3357	<i>Laboratory in Theoretical Physics</i>	3		45		PHY2404 PHY3608
75	PHY3472	<i>Standard Models and Beyond</i>	3	45			PHY3514
76	PHY3471	<i>Cosmology</i>	3	45			PHY3510
77	PHY3525	<i>Introduction to Particle Physics and High Energy Physics</i>	3	30	15		PHY2404
78	PHY3338	<i>Particle Theory</i>	3	35	10		PHY2404

No.	Code	Subject	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
79	PHY3378	<i>Laboratory in High Energy Physics and Cosmology</i>	3	5	40		PHY3471 PHY3338 PHY3514
80	PHY3515	<i>Seismology</i>	3	30	10	5	PHY1010 PHY2304
81	PHY3526	<i>Potential Methods Applied in Geophysics</i>	3	30	10	5	PHY2304 PHY3604
82	PHY3418	<i>Geoelectrical Methods</i>	3	25	15	5	PHY1010 PHY2303
83	PHY3406	<i>Radioactive and Nuclear Geophysics</i>	3	30	10	5	PHY2304 PHY3601
84	PHY3407	<i>Logging Methods</i>	3	30	10	5	PHY2304 PHY3601
85	PHY3359	<i>Laboratory in Physics of the Earth</i>	3	10	30	5	PHY3419
86	PHY3512	<i>Pulse and Digital Modulation</i>	3	30	15		PHY3610
87	PHY3517	<i>Theory of Digital Signal Processing</i>	3	30	15		PHY3610
88	PHY3521	<i>Theory of Digital Communication</i>	3	30	15		PHY3609 PHY3610
89	PHY3522	<i>Microcontrollers</i>	3	15	30		PHY3610
90	PHY3523	<i>Applied Electronics for Measurement</i>	3	15	30		PHY3610
91	PHY3311	<i>Measurement and Signal Processing Techniques</i>	3	45			PHY3610
92	PHY3423	<i>Principle and Application of Ultrasound</i>	3	30	15		PHY3610
93	PHY3375	<i>Laboratory in Modern Electronics</i>	3		45		PHY3512 PHY3517
94	PHY3432	<i>Simulation of Physics Problems</i>	3	35	10		PHY3502
95	PHY3335	<i>Embedded Systems</i>	3	30	15		INT1005 PHY3610

No.	Code	Subject	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
96	PHY3336	<i>Programming for Mobile and Web</i>	3	30	15		INT1005
97	PHY3307	<i>Database Systems</i>	3	30	15		INT1005
98	PHY3380	<i>Parallel Computing</i>	3	30	15		INT1005
99	PHY3376	<i>Laboratory in Computational Physics and Applied Informatics</i>	3	10	30	5	INT1005
100	PHY3398	<i>Radiation Detection and Measurement</i>	3	45			PHY2004
101	PHY3362	<i>Neutron Science and Reactor Physics</i>	3	45			PHY3398
102	PHY3372	<i>Nuclear Electronics</i>	3	45			PHY3610 PHY3351
103	PHY3363	<i>Nuclear Structure</i>	3	45			PHY2004
104	PHY3368	<i>Nuclear Reactions</i>	3	45			PHY3398
105	PHY3611	<i>Nuclear Physics Practice</i>	3		45		PHY2004
106	PHY3530	<i>Introduction to Biophysics</i>	3	33	12		PHY2303
V.3		<i>Undergraduate thesis</i>	10				
107	PHY4077	<i>Thesis</i>	10				
		<b>Total</b>	<b>170</b>				